INFUSION PUMP ASSEMBLY

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] This application is a continuation of U.S. application Ser. No. 14/886,865 filed on Oct. 19, 2015, which is a continuation of U.S. application Ser. No. 13/953,183 filed on Jul. 29, 2013, now U.S. Pat. No. 9,162,027, issued on Oct. 20, 2015, which is a continuation of Ser. No. 12/347,981 filed on Dec. 31, 2008, now U.S. Pat. No. 8,496,646, issued on Jul. 30, 2013, which is a continuation-in-part of U.S. application Ser. No. 11/704,899 filed Feb. 9, 2007, now U.S. Pat. No. 8,414,522, issued on Apr. 9, 2013, which claims priority to U.S. Provisional Application Ser. No. 60/772,313, filed Feb. 9, 2006, U.S. Provisional Application Ser. No. 60/789,243, filed Apr. 5, 2006, and U.S. Provisional Application Ser. No. 60/793,188, filed Apr. 19, 2006, each of which applications is hereby incorporated herein by reference in its entirety. U.S. application Ser. No. 12/347,981 filed on Dec. 31, 2008, now U.S. Pat. No. 8,496,646, issued on Jul. 30, 2013, also claims priority to U.S. Provisional Application Ser. No. 61/018,054 filed Dec. 31, 2007, U.S. Provisional Application Ser. No. 61/018,042 filed Dec. 31, 2007, U.S. Provisional Application Ser. No. 61/017,989 filed Dec. 31, 2007, U.S. Provisional Application Ser. No. 61/018,002 filed Dec. 31, 2007, U.S. Provisional Application Ser. No. 61/018,339 filed Dec. 31, 2007, U.S. Provisional Application Ser. No. 61/023,645 filed Jan. 25, 2008, U.S. Provisional Application Ser. No. 61/101,053 filed Sep. 29, 2008, U.S. Provisional Application Ser. No. 61/101,077 filed Sep. 29, 2008, U.S. Provisional Application Ser. No. 61/101,105 filed Sep. 29, 2008, and U.S. Provisional Application Ser. No. 61/101,115, filed Sep. 29, 2008, each of which applications is hereby incorporated herein by reference in its entirety. U.S. application Ser. No. 12/347,981 filed on Dec. 31, 2008, now U.S. Pat. No. 8,496,646, issued on Jul. 30, 2013, is also a continuation-in-part of U.S. application Ser. No. 11/704,896, filed Feb. 9, 2007, now U.S. Pat. No. 8,585,377, issued on Nov. 19, 2013, which claims priority to U.S. Provisional Application Ser. No. 60/772,313, filed Feb. 9, 2006, U.S. Provisional Application Ser. No. 60/789,243, filed Apr. 5, 2006, and U.S. Provisional Application Ser. No. 60/793,188, filed Apr. 19, 2006, each of which applications is hereby incorporated herein by reference in its entirety. U.S. application Ser. No. 12/347,981 filed on Dec. 31, 2008, now U.S. Pat. No. 8,496,646, issued on Jul. 30, 2013, is also a continuation-in-part of U.S. application Ser. No. 11/704,886 filed Feb. 9, 2007, now U.S. Pat. No. 8,545,445, issued on Oct. 1, 2013, which claims priority to U.S. Provisional Application Ser. No. 60/772,313, filed Feb. 9, 2006, U.S. Provisional Application Ser. No. 60/789,243, filed Apr. 5, 2006, and U.S. Provisional Application Ser. No. 60/793,188, filed Apr. 19, 2006, each of which applications is hereby incorporated herein by reference in its entirety. U.S. application Ser. No. 12/347,981 filed on Dec. 31, 2008, now U.S. Pat. No. 8,496,646, issued on Jul. 30, 2013, is also a continuation-in-part of Ser. No. 11/704,897 filed Feb. 9, 2007, now U.S. Pat. No. 8,113,244, issued on Feb. 14, 2012, which claims priority to U.S. Provisional Application Ser. No. 60/772,313, filed Feb. 9, 2006, U.S. Provisional Application Ser. No. 60/789,243, filed Apr. 5, 2006, and U.S. Provisional Application Ser. No. 60/793,188, filed Apr. 19, 2006, each of which applications is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] This application relates generally to fluid delivery systems, and more particularly to infusion pump assemblies.

BACKGROUND

[0003] Many potentially valuable medicines or compounds, including biologicals, are not orally active due to poor absorption, hepatic metabolism or other pharmacokinetic factors. Additionally, some therapeutic compounds, although they can be orally absorbed, are sometimes required to be administered so often it is difficult for a patient to maintain the desired schedule. In these cases, parenteral delivery is often employed or could be employed.

[0004] Effective parenteral routes of drug delivery, as well as other fluids and compounds, such as subcutaneous injection, intramuscular injection, and intravenous (IV) administration include puncture of the skin with a needle or stylet. Insulin is an example of a therapeutic fluid that is self-injected by millions of diabetic patients. Users of parenterally delivered drugs may benefit from a wearable device that would automatically deliver needed drugs/compounds over a period of time.

[0005] To this end, there have been efforts to design portable and wearable devices for the controlled release of therapeutics. Such devices are known to have a reservoir such as a cartridge, syringe, or bag, and to be electronically controlled. These devices suffer from a number of drawbacks including the malfunction rate. Reducing the size, weight and cost of these devices is also an ongoing challenge. Additionally, these devices often apply to the skin and pose the challenge of frequent re-location for application.

SUMMARY OF THE INVENTION

[0006] According to a first implementation, a wearable infusion pump assembly includes a reservoir for receiving an infusible fluid, and an external infusion set configured to deliver the infusible fluid to a user. A fluid delivery system is configured to deliver the infusible fluid from the reservoir to the external infusion set. The fluid delivery system includes a volume sensor assembly, and a pump assembly for extracting a quantity of infusible fluid from the reservoir and providing the quantity of infusible fluid to the volume sensor assembly. The volume sensor assembly is configured to determine the volume of at least a portion of the quantity of fluid. The fluid delivery system also includes a first valve assembly configured to selectively isolate the pump assembly from the reservoir. The fluid delivery system further includes a second valve assembly configured to selectively isolate the volume sensor assembly from the external infusion set.

[0007] One or more of the following features may be included. The wearable infusion pump assembly may also include a disposable housing assembly including the reservoir and a first portion of the fluid delivery system. The wearable infusion pump assembly may also include a reusable housing assembly including a second portion of the fluid delivery system. A first portion of the pump assembly may be positioned within the disposable housing assembly. A second portion of the pump assembly may be positioned within the reusable housing assembly. A first portion of the first valve assembly may be positioned within the disposable housing assembly. A second portion of the first valve assembly may be positioned within the reusable housing assembly.